

We claim:

1. A process for preparing an aqueous polysilicate microgel which comprises mixing
5 (i) an aqueous solution of alkali metal silicate with (ii) an aqueous phase of silica-based material having a pH of 11 or less and (iii) a metal salt other than an aluminium salt.
2. The process of claim 1, wherein the metal salt is based on an alkali metal or alkaline earth metal and has an anion which is selected from hydroxide, borate, nitrate or acetate.
10
3. The process of claim 1, wherein the metal salt is a borate.
4. The process of claim 1, wherein the polysilicate microgel obtained has a molar
15 ratio $\text{SiO}_2:\text{M}_2\text{O}$, where M is alkali metal, between 3:1 and 20:1.
5. The process of claim 1, wherein the aqueous silica-based material has a pH within the range of from 7 to 11.
20
6. The process of claim 1, wherein the aqueous polysilicate microgel obtained has a SiO_2 content of at least 5% by weight.
7. The process of claim 1, wherein the polysilicate microgel has a specific surface area of at least $1000 \text{ m}^2/\text{g}$.
25
8. Aqueous polysilicate microgel obtained by mixing (i) an aqueous solution of alkali metal silicate with (ii) an aqueous phase of silica-based material having a pH of 11 or less and (iii) a metal salt other than an aluminium salt.
30
9. The aqueous polysilicate microgel of claim 8, wherein the metal salt is based on an alkali metal or alkaline earth metal and has an anion which is selected from hydroxide, borate, nitrate or acetate.
35
10. The aqueous polysilicate microgel of claim 8, wherein the metal salt is a borate.
40

14. 11. The aqueous polysilicate microgel of claim 8, wherein it has a molar ratio SiO₂:M₂O, where M is alkali metal, between 3:1 and 20:1.
- 5 15. 11. 12. The aqueous polysilicate microgel of claim 8, wherein it has a SiO₂ content of at least 5% by weight.
16. 11. 13. The aqueous polysilicate microgel of claim 8, wherein the polysilicate microgel has a specific surface area of at least 1000 m²/g.
- 10 22. 14. A process for preparing an aqueous polysilicate microgel which comprises mixing (i) an aqueous solution of alkali metal silicate with (ii) an aqueous phase of silica-based material having a pH within the range of from 4.5 to 11.
- 15 23. 22. 15. The process of claim 14, wherein it comprises admixing an additional salt which is a metal salt other than an aluminium salt and based on alkali metal salt or alkaline earth metal.
- 20 24. 22. 16. The process of claim 15, wherein the salt is a borate.
- Subj. 17. The process of claim 14, wherein it comprises admixing an aluminium salt.
- 25 26. 22. 18. The process of claim 14, wherein the polysilicate microgel obtained has a molar ratio SiO₂:M₂O, where M is alkali metal, between 3:1 and 20:1.
27. 22. 19. The process of claim 14, wherein the aqueous silica-based material has a pH within the range of from 7 to 11.
- 30 28. 22. 20. The process of claim 14, wherein the aqueous polysilicate microgel obtained has a SiO₂ content of at least 15%.
29. 22. 21. The process of claim 14, wherein the polysilicate microgel has a specific surface area of at least 1000 m²/g.

30

22 The process of claim 14, wherein the silica-based material contains aluminium.

Sub
A3

23. Aqueous polysilicate microgel obtained by mixing (i) an aqueous solution of alkali metal silicate with (ii) an aqueous phase of silica-based material having a pH within the range of from 4.5 to 11.

24. The aqueous polysilicate microgel of claim 23, wherein it comprises admixing an additional salt which is a metal salt other than an aluminium salt and based on alkali metal salt or alkaline earth metal.

10

36

25 The aqueous polysilicate microgel of claim 24, wherein the salt is a borate.

42

26. A process for preparing an aqueous polysilicate microgel which comprises mixing (i) an aqueous solution of alkali metal silicate with (ii) an aqueous phase of silica-based material having a pH of 11 or less and (iii) a metal salt, wherein the aqueous polysilicate microgel obtained has a molar ratio of $\text{SiO}_2:\text{M}_2\text{O}$, where M is alkali metal, between 3:1 and 20:1.

20

43

27. The process of claim 26, wherein the salt is a metal salt other than an aluminium salt and based on an alkali metal or alkaline earth metal.

0
1
2
3
4
5
6
7
8
9

44

28. The process of claim 27, wherein the salt is a borate.

45

29. The process of claim 26, wherein the aqueous silica-based material has a pH within the range of from 7 to 11.

30

46

30. The process of claim 28, wherein the aqueous polysilicate microgel obtained has a SiO_2 content of at least 15%.

47

31. The process of claim 26, wherein the polysilicate microgel has a specific surface area of at least $1000 \text{ m}^2/\text{g}$.

48

32.

Aqueous polysilicate microgel obtained by the process of claim 28.

42

Sub
S/33

5

33. Aqueous polysilicate microgel having a SiO₂ content of at least 17.5% by weight and a molar ratio of SiO₂ to Na₂O of from 5:1 to 20:1.

34. The aqueous polysilicate microgel of claim 33, wherein it comprises silica-based particles with a size of about 1 to 2 nm in diameter which are linked together in chains or networks to form three-dimensional structures.

10

53

35.

The aqueous polysilicate microgel of claim 35, wherein the polysilicate microgel has a specific surface area of at least 1000 m²/g.

Add 7
A4

Add
E17

Add C1
Add C2

19
20